

- 20 of 27 -

CLAIMS

1. A support element for an extracorporeal fluid transport line, comprising:
 - a first and a second lateral portion (20, 22) designed to hold corresponding portions of the transport line (2) to delimit at least a first length of tubing (18); and
 - a rigid cross-piece (23) for connecting the lateral portions (20, 22);characterised in that the first lateral portion (20) incorporates a continuous fluid separator (10) capable of separating fluid into a gaseous portion and a liquid portion.
2. The element of Claim 1, characterised in that the separator (10) comprises a containing body (11) having:
 - at least one inlet (12) for receiving a fluid;
 - at least a first outlet (13) for receiving a liquid portion of the said fluid;
 - selector means (15) interposed between the said inlet (12) and the said first outlet (13) and capable of continuously separating fluid into a gaseous portion and a liquid portion.
3. The element of Claim 2, characterised in that the said containing body (11) of the said separator comprises at least a second outlet (14) for receiving the gaseous portion of the said fluid.
4. The element of Claim 2 or 3, characterised in that the said selector means (15) comprise at least one hydrophilic membrane (16) having one side (16a) facing the said first outlet (13) and one side (16b) facing the said inlet (12), for receiving the said fluid and transferring only liquid towards the said first outlet (13).

- 21 of 27 -

5. The element of Claim 3 or 4, characterised in that the said selector means (15) comprise at least one hydrophobic membrane (17) having one side (17a) facing the said second outlet (14) and one side (17b) facing the said inlet (12), for receiving the said fluid and transferring only gas towards the said second outlet (14).
6. The element of any one of Claims 1 to 5, characterised in that the said first length of tubing (18) has a curved shape and a specified axial extension.
7. The element of any one of Claims 1 to 6, characterised in that the said second lateral portion (22) has a tubular profile and is designed to receive one end of the said first length of tubing (18) and one end of a second length of tubing (19), which are fixed in this portion.
8. The element of any one of Claims 5 to 7, characterised in that the said containing body (11) comprises a base (25) and a cover portion (26), interacting with each other to form a passage (27) for fluid between the said inlet (12) and the said first and second outlets (13 and 14).
9. The element of Claim 8, characterised in that the said base (25) forms a through channel (28) for putting the said passage (27) into fluid communication with the exterior, the said hydrophobic membrane (17) operating in the said channel.
10. The element of Claim 8 or 9, characterised in that the said base (25) comprises an incorporated first tubular connecting element (29).
11. The element of Claim 10, characterised in that the said cover portion comprises an incorporated second tubular connecting element (30) having an axis of extension inclined with respect to that of the said first tubular connecting element (29).

- 22 of 27 -

12. The element of any one of Claims 8 to 11, characterised in that the said hydrophilic membrane (16) is interposed between the said base (25) and the said cover portion (26), and extends essentially throughout the said containing body (11).
13. The element of any one of Claims 8 to 12, characterised in that each of the said base (25) and the said cover portion (26) comprises a corresponding base wall (25a, 26a) and a corresponding perimeter edge (25b, 26b) emerging from the said base wall, the said hydrophilic membrane (16) extending parallel to the said base walls (25a, 26a) in a position separated from them.
14. The element of Claim 13, characterised in that the said containing body (11) has a plurality of projections (31) emerging from the said base wall (25a) of the said base.
15. The element of Claim 13 or 14, characterised in that the said containing body has a plurality of projections (32) emerging from the said base wall (26a) of the said cover portion.
16. The element of Claim 14 or 15, characterised in that the said base projections (31) comprise teeth distributed uniformly over a surface of the said base wall (25a) of the said base.
17. The element of Claim 15 or 16, characterised in that the said cover portion projections (32) comprise deflectors spaced angularly to guide the flow of liquid towards the said first outlet (13).
18. The element of any one of Claims 8 to 17, characterised in that the said base (25) of the said containing body, the said rigid cross-piece (23) and the said second lateral portion (22) are made in a single piece.

- 23 of 27 -

19. The element of any one of Claims 1 to 18, characterised in that the said rigid cross-piece (23) is essentially flat and parallel to a plane in which the said first length of tubing (18) lies.
20. The element of any one of the preceding claims, characterised in that the said continuous fluid separator (10) incorporates at least one check valve (36) predisposed to prevent a flow in the said transport line (2) which is inverse to a desired transport direction.
21. The element of claim 20, characterised in that the said check valve (36) is predisposed along a pathway of the said liquid portion, after the said liquid portion has been separated from the said gaseous portion by the said fluid separator (10).
22. The element of claim 21 and of claim 2, characterised in that the said check valve (36) is arranged internally of the said containing body (11) in a zone comprised between the said selector means (15) and the said first outlet (13).
23. The element of any of claims from 20 to 22, characterised in that the said check valve (36) comprises a mobile obturator organ (37), which operates on a passage mouth (35) of the said liquid portion.
24. The device of claim 23 and of claim 8, characterised in that the said passage mouth (35) is associated to the said cover portion (26) of the said containing body (11).
25. The element of claim 24, characterised in that the said selector means (15) comprise at least one hydrophilic membrane (16) facing and distanced from a base wall (26a) of the said cover portion (26), the said passage mouth (35) being associated to the said base wall (26a).

- 24 of 27 -

26. The element of any one of preceding claims from 5 to 25, characterised in that the said containing body (11) internally defines a fluid passage (27) between the said separator inlet (12) and the said first outlet (13), the said hydrophobic membrane (17) being situated in an upper zone of a fluid passage portion (27a) located upstream of the said hydrophilic membrane (16), the said hydrophobic membrane (17) facing upwards, with reference to a use configuration of the said support element (1), in which configuration the said first length of tubing (18) has a vertical lie plane.
27. The element of claim 26, characterised in that the said upstream passage portion (27a) for passage of fluid has at least one passage section which increases in a direction towards the said hydrophobic membrane (17).
28. The element of claim 26 or 27, characterised in that the said hydrophobic membrane (17) is located superiorly with respect to an upper point of the operative surface of the said hydrophilic membrane (16).
29. The element of any one of claims from 2 to 28, characterised in that the said containing body (11) has a development which is prevalently in a transversal direction proceeding from the said first lateral portion (20) to the said second lateral portion (22), the said first outlet (13) being located in a lateral end zone of the said transversal development, in proximity of the said second lateral portion (22).
30. The element of claim 29, characterised in that the said second outlet (14) is arranged in an intermediate zone of the said transversal development.
31. The element of any one of claims from 4 to 30, characterised in that the said hydrophilic membrane (17) has a vertical lie plane, with reference to a use configuration in which the said first length of tubing (18) has a vertical lie plane.

- 25 of 27 -

32. A gas-liquid separator (10), comprising:

- a containing body (11) having at least one inlet (12) for receiving a fluid and at least a first outlet (13) for receiving a liquid portion of the said fluid, the said containing body (11) affording internally thereof a fluid passage (27) between the said at least one inlet (12) and the said first outlet (13);
- at least one filtering element (16) arranged internally of the said fluid passage (27) having a side (16a) which faces the said at first outlet (13), and a side (16b) which faces the said at least one inlet (13), for receiving the said fluid and transferring only liquid towards the said first outlet (13), dividing the said fluid passage (27) into an upstream portion (27a) thereof, situated between the said at least one inlet (12) and the said filtering element (16), and a downstream portion (27b) thereof, situated between the said filtering element (16) and the said first outlet (13);
- at least a second outlet (14), being a vent, operatively associated to the said upstream portion (27a) of the said fluid passage (27), for receiving a gaseous portion of the said fluid.

33. The separator of claim 32, characterised in that the said second outlet (14) is situated in an upper zone of the said upstream portion (27a) of the said fluid passage (27), upper meaning in reference to a use configuration of the said separator (10).

34. The separator of claim 33, characterised in that at least a part of the said upstream portion (27a) of the said fluid passage has a passage section which increases gradually in an upwards direction, with reference to a use configuration thereof.

- 26 of 27 -

35. The separator of claim 33 or 34, characterised in that the said filtering element (16) is hydrophilic, flat, with a lie plane arranged vertically, with reference to a use configuration thereof.
36. The separator of any one of claims from 32 to 35, comprising a hydrophobic element (17) operating on the said second outlet (14), the said filtering element (16) and the said hydrophobic element (17) being flat and having lie planes arranged one transversally with respect to another.
37. The separator of any one of claims from 33 to 36, characterised in that the said at least one fluid inlet (12) is arranged in a lower zone of the said upstream portion (27a) of the said fluid passage (27), with reference to a use configuration thereof.
38. The separator of any one of claims from 32 to 37, characterised in that the said containing body (11) comprises at least two base walls (25a and 26a), which delimit the said fluid passage and which face opposite sides (16b and 16a) of the said filtering element (16), the said filtering element (16) being distanced from the said base walls (25a and 26a), a plurality of projections (31 and 32) emerging from the said base walls (25a and 26a) defining two rest planes for the said opposite sides (16b and 16a) of the said filtering element (16).
39. An infusion line comprising a support element (1) according to any one of the preceding claims.
40. The infusion line of Claim 39, comprising:
- a container (4) of a liquid to be infused into a patient;
 - a second length of tubing (19) extending between the said container (4) and the said rigid support element (1) and placed in fluid communication with the said first length of tubing (18).